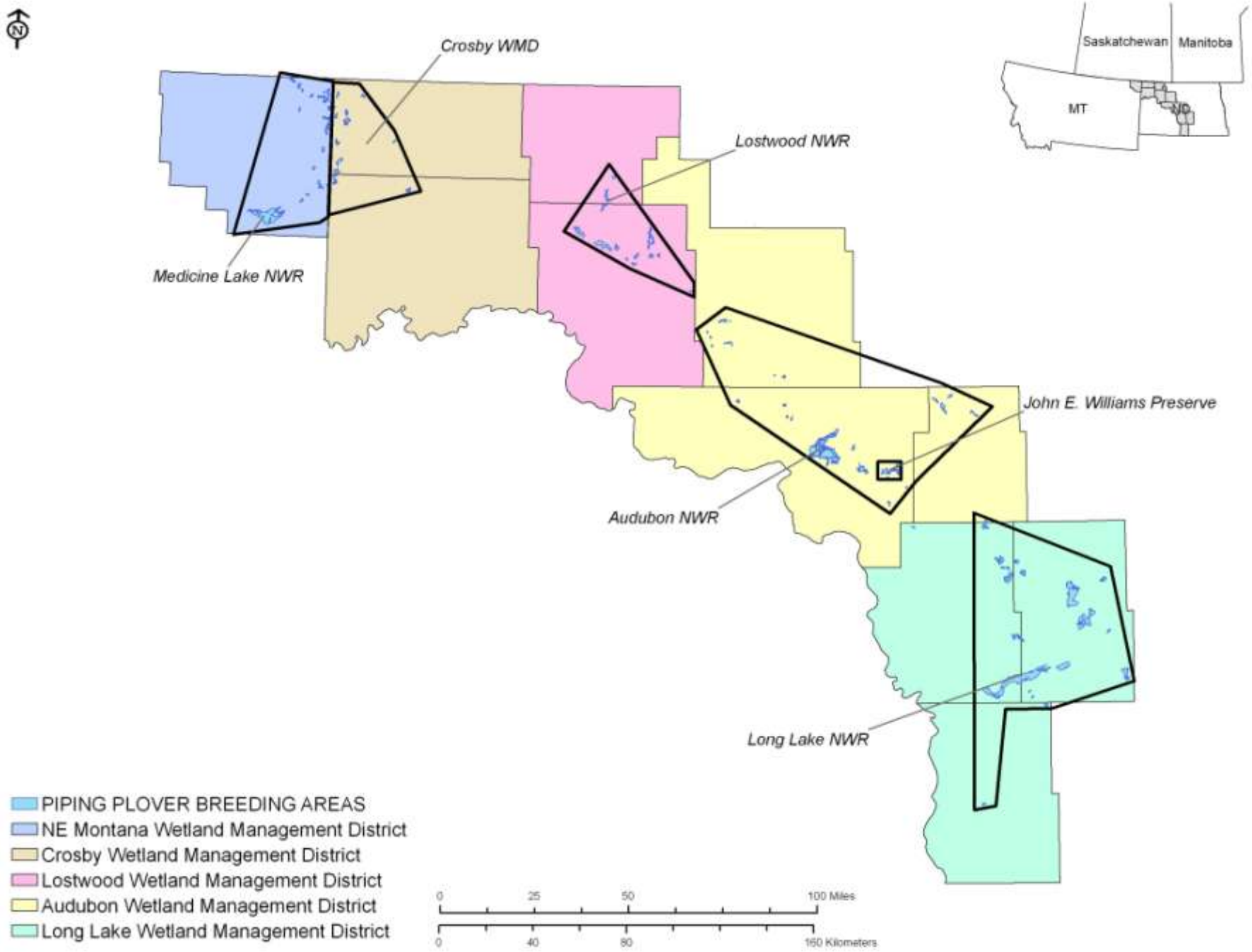
Piping Plover Recovery Program on Alkali Lakes in the U.S. Northern Great Plains


Crosby WMD
Lostwood NWR
Medicine Lake NWR
John E. Williams Preserve
Audubon NWR
Long Lake NWR
Saskatchewan
Manitoba
MT
ND
PIPING PLOVER BREEDING AREAS
NE Montana Wetland Management District
Crosby Wetland Management District
Lostwood Wetland Management District
Audubon Wetland Management District
Long Lake Wetland Management District
0 25 50 100 Miles
0 40 80 160 Kilometers

History of US Alkali Lakes Recovery Program

- mid 1980s: Initial FWS Refuges surveys
- 1994-1997: First region-wide effort to track reproductive success

Murphy, R. K., M. Rabenberg, M Sondreal, B. Casler, D. Guenther 2000. Reproductive Success of Piping Plovers on Alkali Lakes in North Dakota and Montana. Prairie Naturalist 32(4): 233-242.

Can predator exclosures boost repro. success?

Reproductive success of piping plovers under three predator management scenarios, ND 1996-97

(n=20 replicated trials, split-plot design, randomly assigned treatments)

No protection:	0.7 chicks/pr (95% CI	0.3-1.2) *
Cage only	1.7	(1.3-2.2) *
Cage + Fence	2.1	(1.6-2.5)

*categories marked with asterisk differ (P<0.001)

Murphy, R. K., R. J. Greenwood, K. A. Smith, and J. S. Ivan. 2003. Predator exclusion methods for managing endangered shorebirds: are two barriers better than one? Waterbirds 26:156-159.

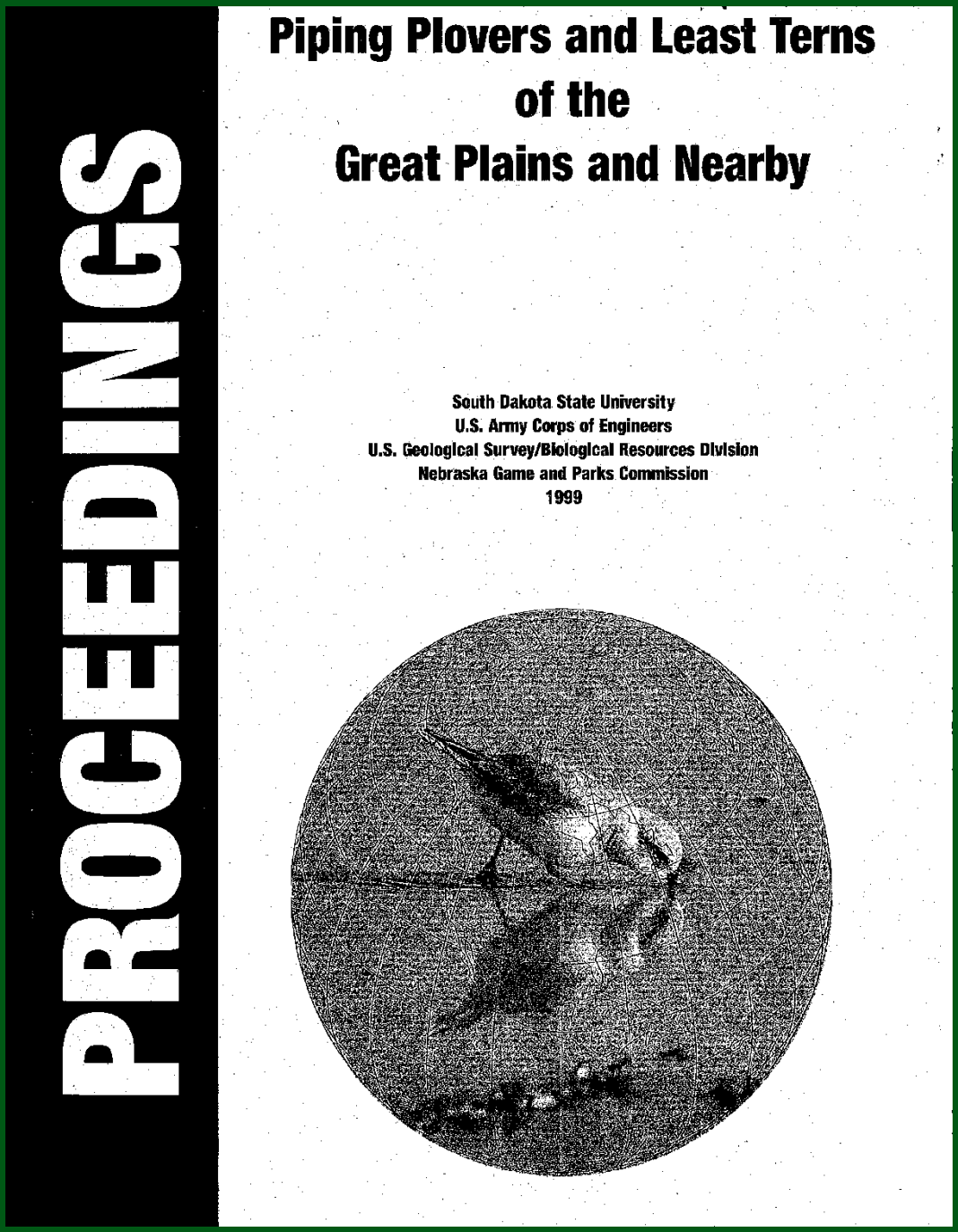
Goal for U.S. Alkali Lakes Core Area:

Region	Fledglings/pair
Alkali Wetlands	1.24
River Systems	0.8
Total	**1.10***

*Minimum to stabilize population - Larson et al. 2002

Monitoring Protocol

Murphy et al 1999



Field Site Maps

Symbols:

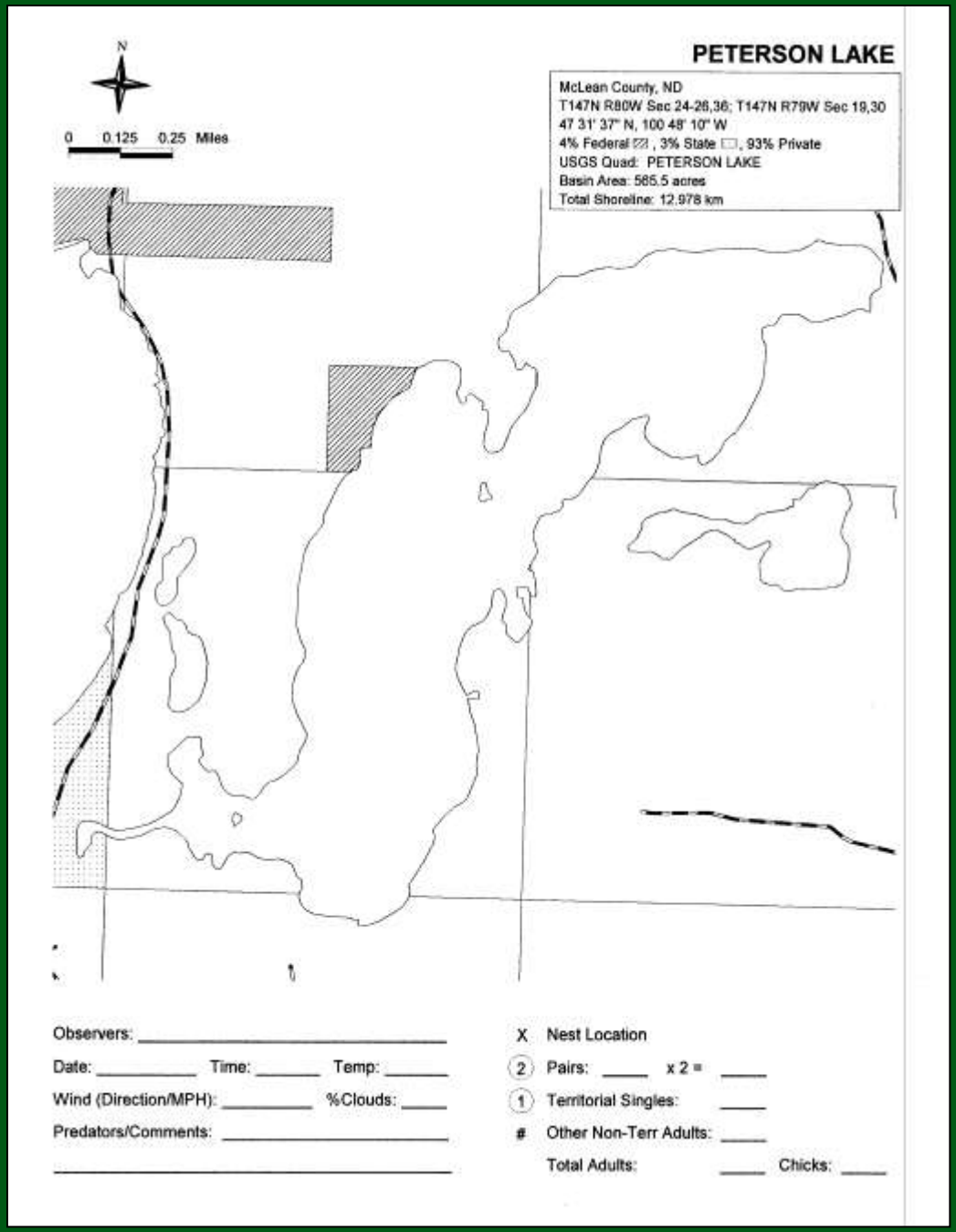
X = nest

(1) = territorial single

(2) = territorial pair

2 = other adults

☐ = pair id #



Excel spreadsheet

TABLE 1. PIPING PLOVER PRODUCTIVITY: CHRONOLOGICAL OBSERVATION LOG (ABBREVIATED SPREADSHEET EXAMPLE)

		date	15	May				5	Jun				19	Jun		6	Jul				15	Jul		SUMMARY			
	Pair	Julian date (31 May=151, 31 Jul=212):																						no.	nest	nest	
Site	ID	...	135	136	137	138	...	156	157	158	...	169	170	171	...	187	188	189	...	195	196	197	...	fldg	fate	E (d)	comment
McCone	1		(l)			pr			4e			(h)		3y,1e				2fl			2fl			2	s	12.0	1 e addled
	2				(l)				3e					D				A						0	u	9.5	
	3					s			pr					4e				D?A						0	unk	6.0	D before h?; no l estimate
	4					s			2e,C					ii				h, 4y			D, A			0	s	32.0	no y after 7/10 hail
Miller L	1				(l)	s sc			4e					D				s			A			0	u	10.0	D before h; no l estimate
	2					(l)			pr sc					4e				ii			3y			3	s	22.0	laying/incub >35 d
	3		(l)						4e			(h)		2y				1fl			1fl			1	s	12.0	1e missing before h
White L	1			s				pr				2e	(R?)				D, s			A				0	u	16.5	prob. renest
	2			s				pr sc				pr					s			A				0	-		nest D before discovery?
	3							pr				pr					4y			2fl				2	-		couldnt find nest
	4			pr				3e				ii					h,4y			3y				3	s	32.0	
	5			s				4e				D					A							0	u	10.0	D before h; no l estimate
	6			pr				4e				???					A							0	unk	7.0	nest D before h? by cattle
	7			pr				1e				ii					ii			3y				0	s	34.0	y lost ~1 wk after h
	8			s				pr				4e	h				3y			D, s				0	s	1.0	found @ pipping
	9							4e				D 1	R				D, s			A				0	u	10.0	RENST fate=u E=13.0d
	10			pr				4e				ii					ii			3y				3	s	27.0	
Appam	1				pr			4e,CF				ii					D, A							0	s	14.0	D after h; no l estimate
	2				pr	(l)		4e,CF									2y				1fl			1	s	17.0	
	3				pr			4e,CF				ii					ii				4e A			0	u	35.0	eggs sterile!
	4							pr, F				4e C					3y				2y			0	s	10.0	y lost just before fledging
Goose L	1		pr						4e,C			(h)		3y				3fl			3fl			3	s	12.0	
	2		s						pr					4e				D, s			A			0	u	9.5	nest found late D before h
	3								4e,C					4y				4y			3fl			3	s	22.5	
	4		pr						pr					pr				s			A			0	-		no nest found
	5		pr						3e,C					ii				h,3y			3y			1	s	31.0	only 3 eggs in clutch

CODES sc=scrape, e=eggs, y=chicks <18-20d, fl=fledglings (chicks ≥18-20d), pr=breeding pair, s=single terr. adult, ii=ad/pair incubating, h or (h)=obs or (projected) hatch

(l)=projected initiation date, D=destroyed/depredated, R=renest initiation date, s=successful, u=destroyed or otherwise unsuccessful, unk=unknown fate,

A=nest and/or territory abandoned, E=exposure days; Management: C='nest cage' exclosure applied, F=elect. mesh fencing applied on beach, P=prescribd burn

June Census

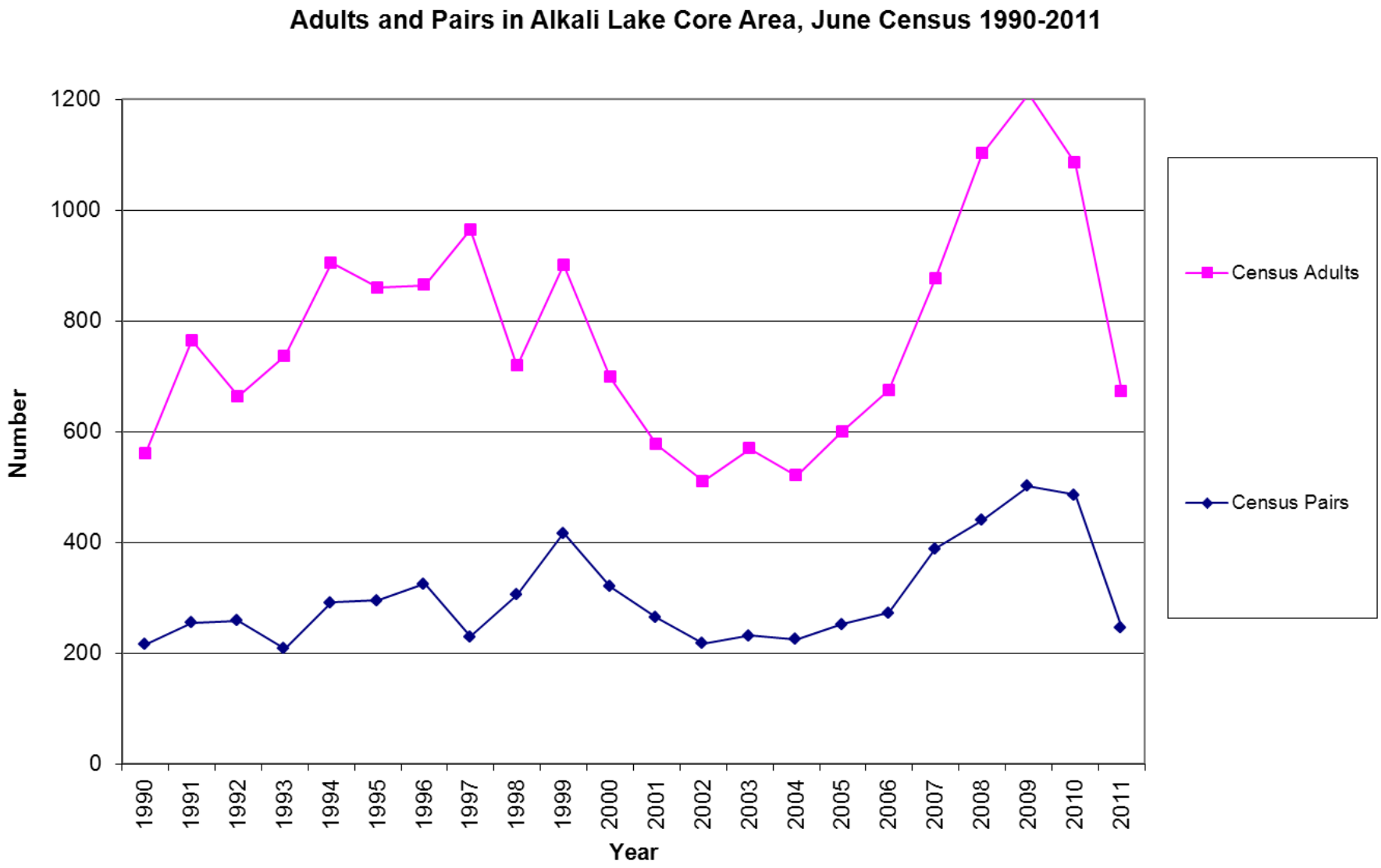
Survey ~150 wetlands

~ 1 - 15 June

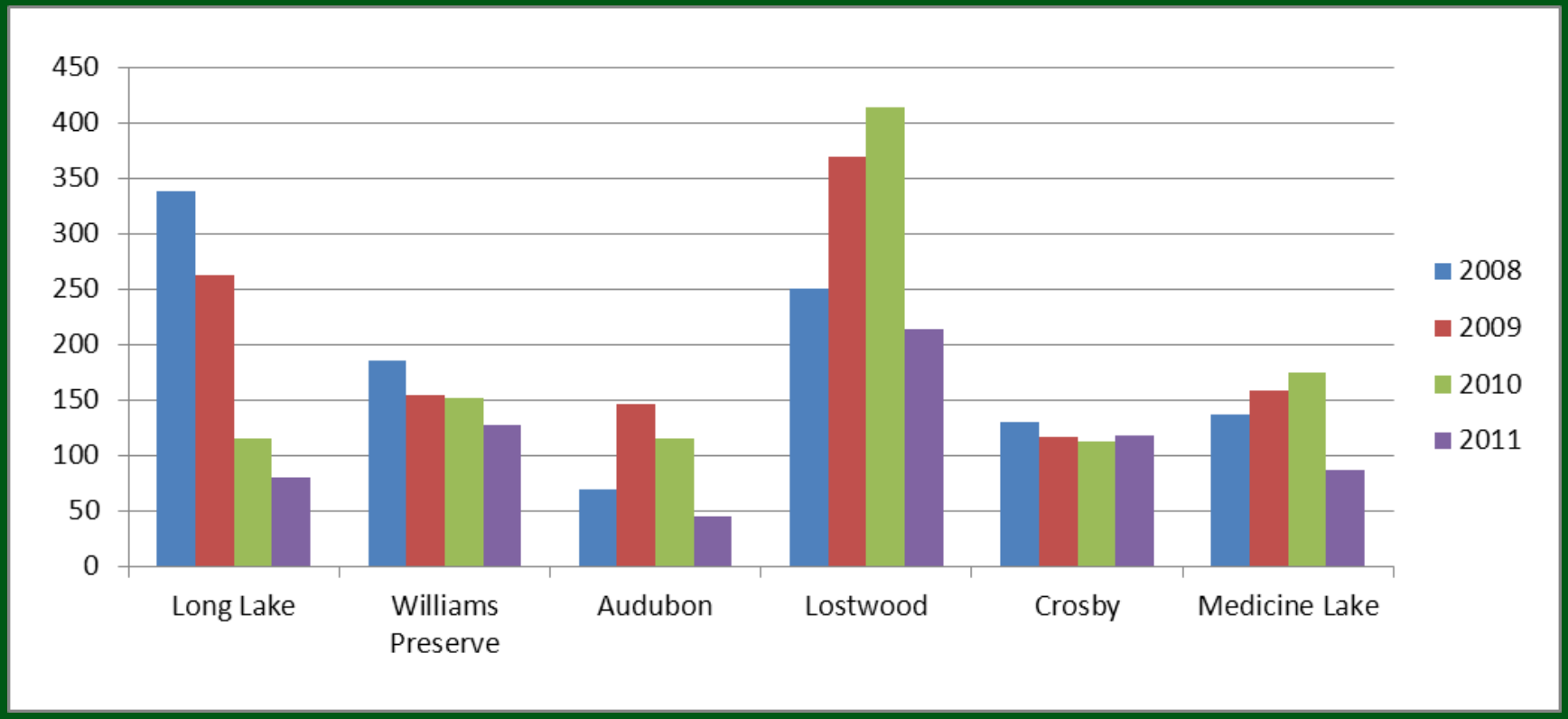
Distribution of pairs

Apply management actions/reproductive monitoring

Data useful for review of energy development projects


Adults and Pairs in Alkali Lake Core Area, June Census 1990-2011
Number
1200
1000
800
600
400
200
0
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
Year
Census Adults
Census Pairs

Number of Piping Plover Adults Observed in Core Area from 2008 -2011

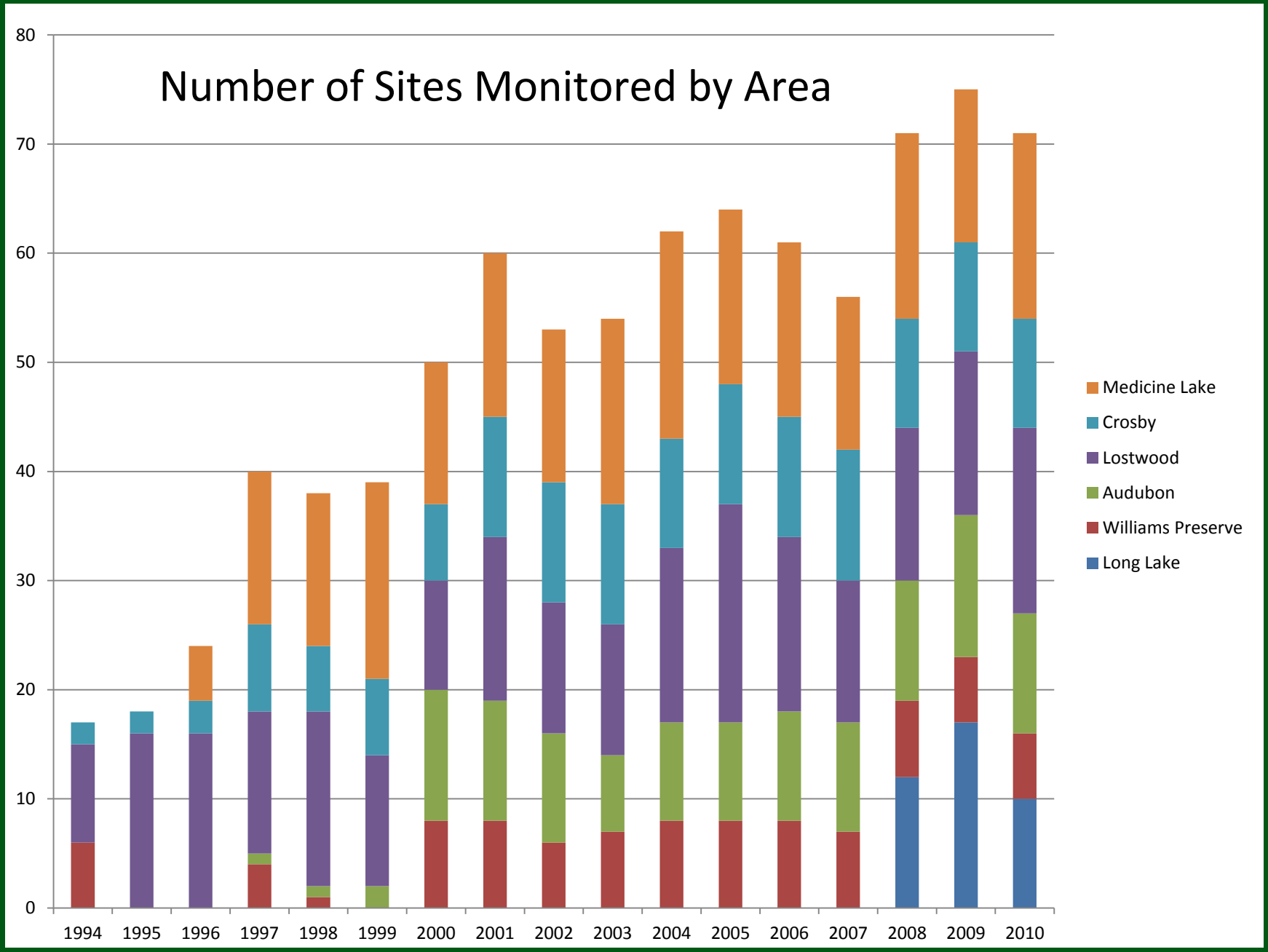


	2008	2009	2010	2011
Number of adults counted	1114	1210	1085	672
Number of sites surveyed	148	154	150	172
Sites occupied by plovers	61.5%	61.0%	56.0 %	35.5%

Reproductive monitoring

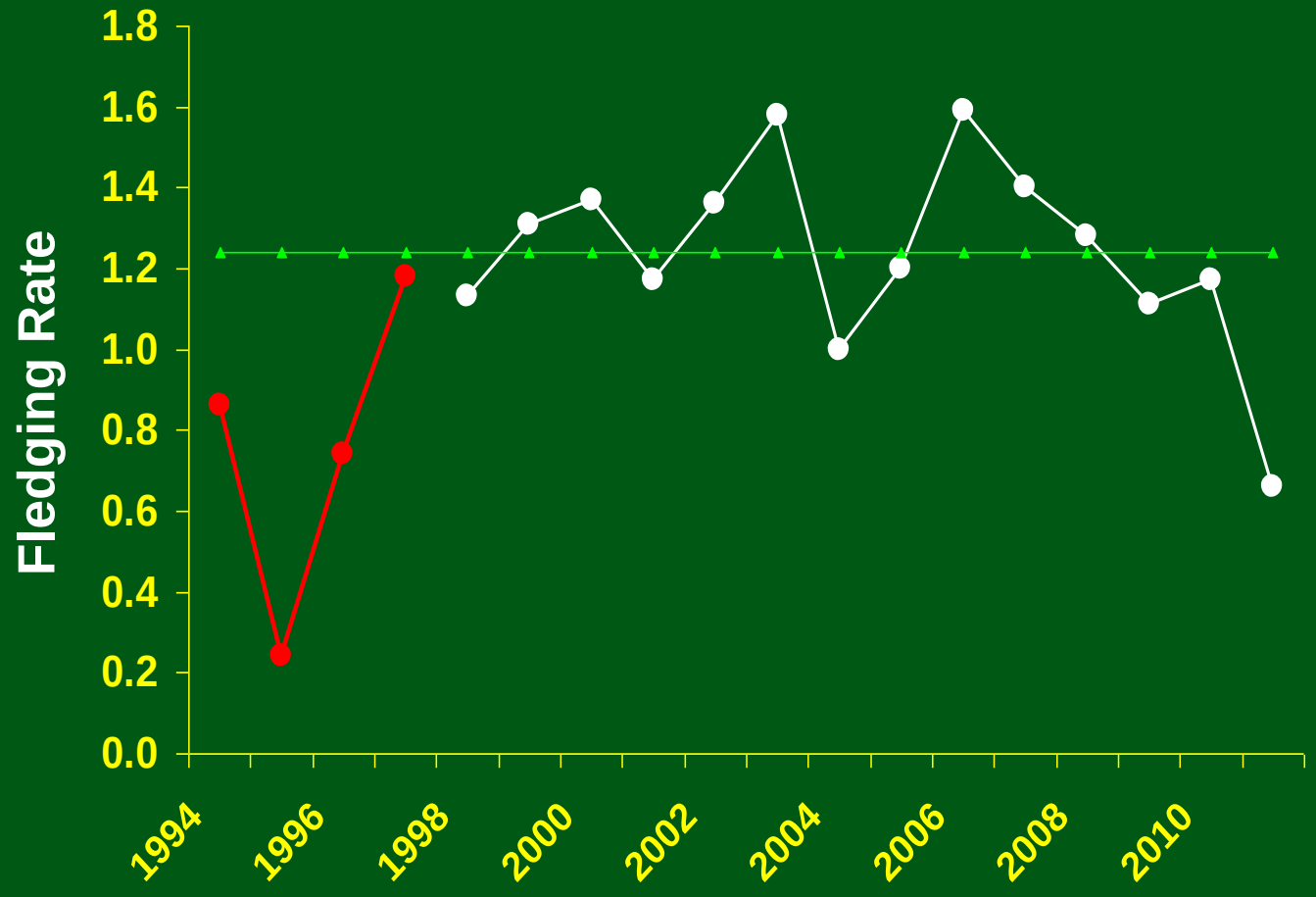
Mayfield Nest Success estimates:

- 1994-1998: 16.3 - 53.0%
- 2001-2010: 63.0 – 75.3 %



Data Summary (Marissa Ahlering, TNC)

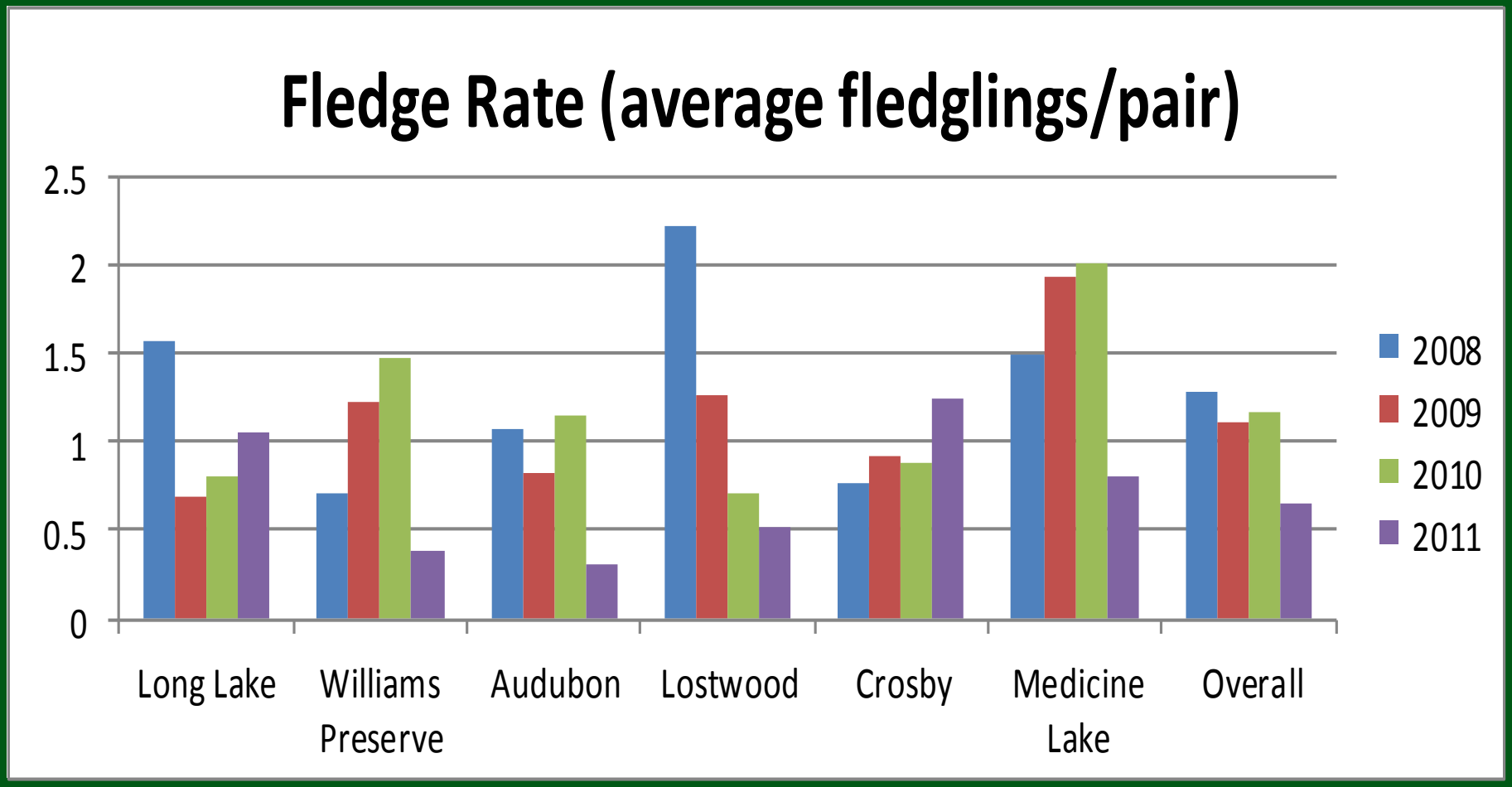
Fledge rate (fledglings per breeding pair) on alkali lakes from 1994-2011



Red = unprotected nests

White = nests protected (~70%)

Green line = goal of 1.24 fledglings/pair


Fledge Rate (average fledglings/pair)
2.5
2
1.5
1
0.5
0
Long Lake
Williams Preserve
Audubon
Lostwood
Crosby
Medicine Lake
Overall
2008
2009
2010
2011

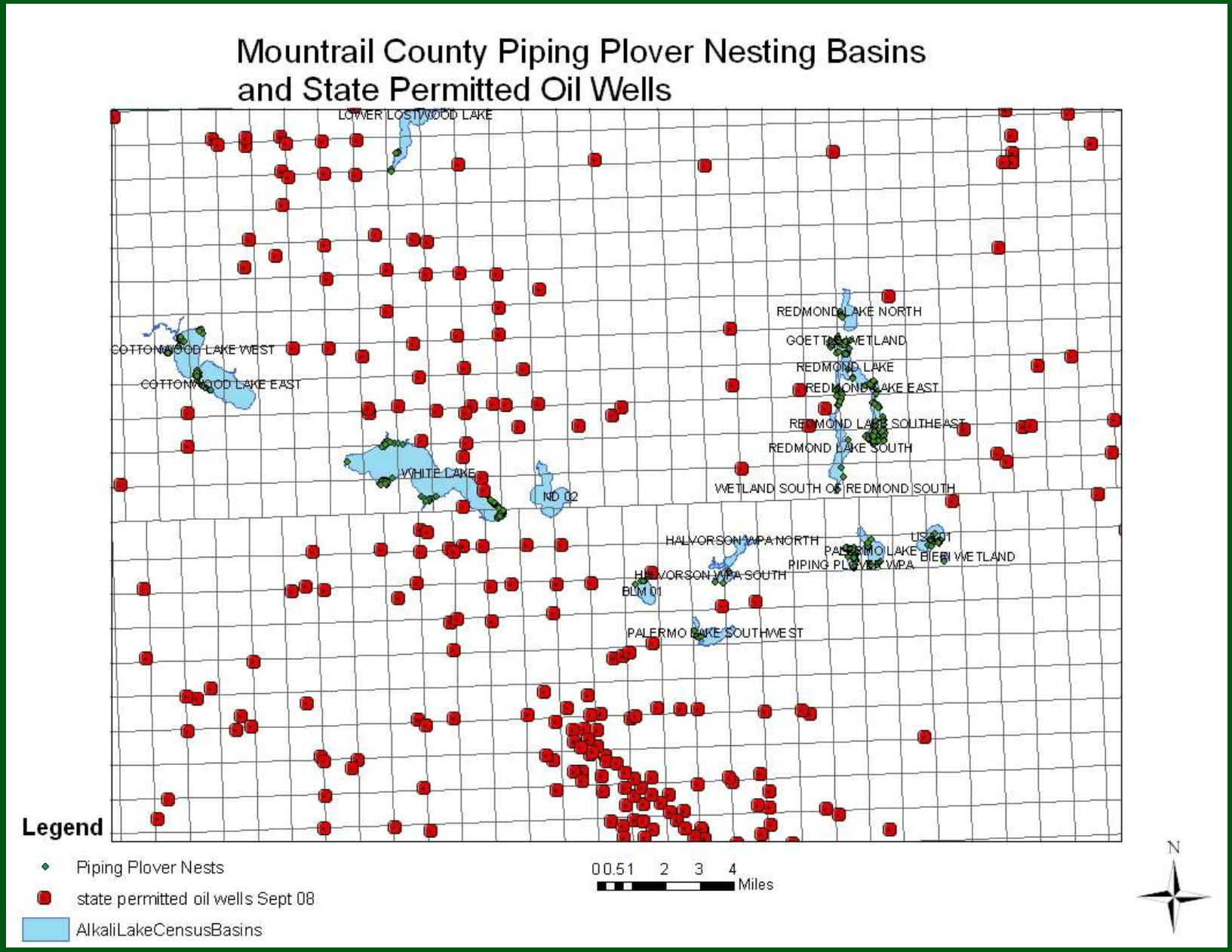
Working with Private Landowners

- In 2007, 52% of pairs monitored occurred on wetlands owned (or access controlled) by private landowners


2011

Piping plovers nesting in agricultural fields

Threats


Mountrail County Piping Plover Nesting Basins
and State Permitted Oil Wells
LOWER LOSTWOOD LAKE
COTTONWOOD LAKE WEST
COTTONWOOD LAKE EAST
WHITE LAKE
ND 02
REDMOND LAKE NORTH
GOETTLER WETLAND
REDMOND LAKE
REDMOND LAKE EAST
REDMOND LAKE SOUTHEAST
REDMOND LAKE SOUTH
WETLAND SOUTH OF REDMOND SOUTH
HALVORSON WPA NORTH
US 01
PALERMO LAKE
BIEBI WETLAND
PIPING PLOVER WPA
HALVORSON WPA SOUTH
BLM 01
PALERMO LAKE SOUTHWEST
Legend
Piping Plover Nests
state permitted oil wells Sept 08
AlkaliLakeCensusBasins
0 0.5 1 2 3 4
Miles
N

Challenges……

Maintaining/expanding partnerships with private landowners in area of high energy development.

Funding flat/ declining as area expands.

Work smarter. Prioritize and goal setting with TNC.

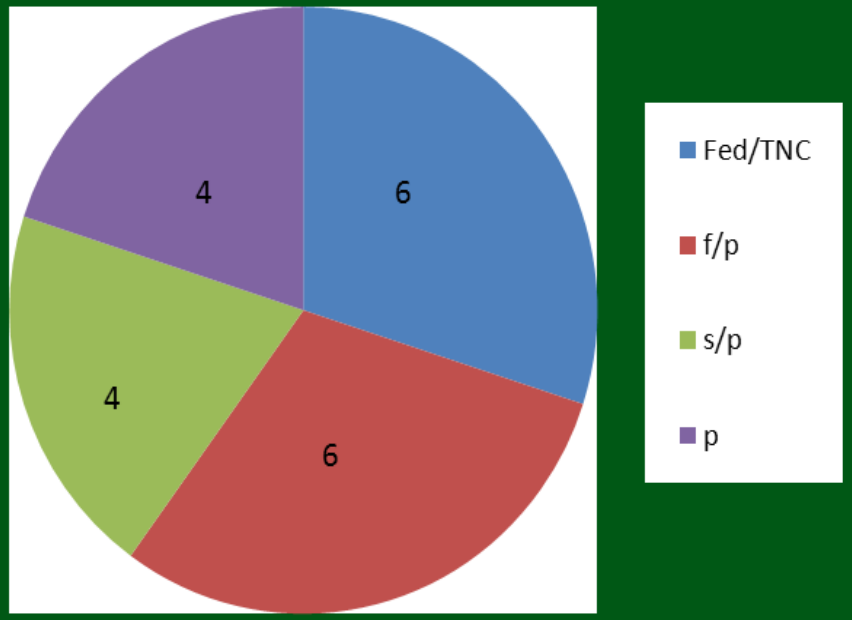
Nest data (1994-2010) on 133 wetlands

(Marissa Ahlering, TNC)

10 basins averaged greater than 10 nests per year

Top 20 nesting basins contained 64% of the nests

Area	# of basins
Long Lake	1
Williams	5
Audubon	3
Lostwood	7
Crosby	2
Medicine Lake	2



Priorities

Comprehensive monitoring strategy for entire NGP population

Low intensity (ACOE/FWS): monitoring everywhere

Or

High intensity (USGS): monitoring smaller sample of sites

Discussion

What is the status of NGP population of plovers? Can June census/international census track this?

If we only are able to check nests every 7+ days, how accurate are nest fate assignments?

Is our fledge rate data accurate, particularly in high density nesting areas?